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Appl. No. 10/583,587
Amdt. Dated March 2, 2009
Reply to Office Action of September 2, 2008

The Pending Claims:

This listing will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Previously presented): A method for directly separating and purifying polyhydroxyalkanoates in cells from a bacterial fermentation liquid, which comprises the steps of:

- a) physically pretreating a fermentation liquid containing cells to cause the walls of the cells to break;
 - b) adjusting the pH value of the pretreated fermentation liquid from step a) to an alkaline condition;
 - c) adding anionic surfactant to the solution of step b) and subjecting the solution to agitation;
 - d) separating and extracting coagulated precipitate from the solution in step c); and
 - e) washing and drying the coagulated precipitate,
- wherein the physical pretreatment includes mechanically breaking the cell walls or ultrasonically breaking the cell walls, and wherein steps b) and c) are interchangeable.

Claim 2 (Previously presented): The method according to claim 1, wherein a coagulating agent is added in the step c).

Claim 3 (Previously presented): The method according to claim 1, wherein the physical pretreatment comprises mechanically breaking the cell walls using ball milling.

Claim 4 (Previously presented): The method according to claim 1, wherein the pH is adjusted in

Appl. No. 10/583,587
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Reply to Office Action of September 2, 2008

step b) to 8-13.

Claim 5 (Previously presented): The method according to claim 1, wherein the pH is adjusted in step b) by adding at least one of NaOH, Na₂CO₃, NaHCO₃ or ammonia to the pretreated fermentation liquid.

Claim 6 (Previously presented): The method according to claim 1, wherein the anionic surfactant added in step c) is at least one of olefin sulfonate, fatty alcohol sulfate, fatty alcohol polyoxyethylene ether sulfate, fatty alcohol polyoxyethylene ether or alkylphenol polyoxyethylene ether.

Claim 7 (Previously presented): The method according to claim 2, wherein the coagulating agent comprises at least one of sodium polyacrylate, modified starch or polyamine.

Claim 8 (Previously presented): The method according to claim 1, wherein in step c) the temperature of the solution is adjusted to 10 - 70°C.

Claim 9 (Previously presented): The method according to claim 1, wherein in step d) the coagulated precipitate is separated and extracted by means of a centrifuge, filter press or vacuum suction filtration.

Claim 10 (Previously presented): The method according to claim 1, claim 1, wherein the physical pretreatment comprises high pressure homogenization.

Claim 11 (Previously presented): The method according to claim 4, wherein the pH is adjusted in step b) by adding at least one of NaOH, Na₂CO₃, NaHCO₃ or ammonia to the pretreated fermentation liquid.

Appl. No. 10/583,587
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Claim 12 (Previously presented): The method according to claim 6, wherein the amount of anionic surfactant added in step c) is 0.5-20% (W/V) of the fermentation liquid.

Claim 13 (Previously presented): The method according to claim 7, wherein the amount of coagulating agent added is 0.5-20% (W/V) of the fermentation liquid.

Claim 14 (Previously presented): The method according to claim 1, wherein in step c) the solution is subjected to agitation for 5 - 60 min.

Claim 15 (Previously presented): The method according to claim 8, wherein in step c) the solution is subjected to agitation for 5 - 60 min.

Claim 16 (Previously presented): The method according to claim 5, wherein the NaOH, Na₂CO₃, NaHCO₃ is added as a solid.

Claim 17 (Previously presented): The method according to claim 5, wherein the NaOH, Na₂CO₃, NaHCO₃ is added as a solution.

Claim 18 (Previously presented): The method according to claim 5, wherein the ammonia comprises ammonia water.